IUBMB Enzyme Nomenclature

EC 1.13.12.7

Common name: *Photinus*-luciferin 4-monooxygenase (ATP-hydrolysing)

Reaction: *Photinus* luciferin + O_2 + ATP = oxidized *Photinus* luciferin + CO_2 + AMP + diphosphate + hν

Glossary: *Photinus*-luciferin = (*S*)-4,5-dihydro-2-(6-hydroxy-1,3-benzothiazol-2-yl)thiazole-4-carboxylic acid

For diagram click here.

Other name(s): firefly luciferase; luciferase (firefly luciferin); *Photinus* luciferin 4-monooxygenase (adenosine triphosphate-hydrolyzing); firefly luciferin luciferase; *Photinus pyralis* luciferase

Systematic name: *Photinus*-luciferin:oxygen 4-oxidoreductase (decarboxylating, ATP-hydrolysing)

Comments: *Photinus* (firefly) is a bioluminescent insect. The first step in the reaction is the formation of an acid anhydride between the carboxylic group and AMP, with the release of diphosphate. The enzyme may be assayed by measurement of light emission.

Links to other databases: BRENDA, EXPASY, KEGG, ERGO, PDB, CAS registry number: 61970-00-1

References:

1. Hopkins, T.A., Seliger, H.H., White, E.H. and Cass, M.W. The chemiluminescence of firefly luciferin. A model for the bioluminescent reaction and identification of the product excited state. *J. Am. Chem. Soc.* 89 (1967) 7148-7150. [Medline UI: 68084818]

2. White, E.H., McCapra, F., Field, G.F. and McElroy, W.D. The structure and synthesis of firefly luciferin. *J. Am. Chem. Soc.* 83 (1961) 2402-2403.

3. White, E.H., Rapaport, E., Hopkins, T.A. and Seliger, H.H. Chemi- and bioluminescence of firefly luciferin. *J. Am. Chem. Soc.* 91 (1969) 2178-2180. [Medline UI: 69204029]

[EC 1.13.12.7 created 1976, modified 1981, modified 1982]

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